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| 10/658,062 | 09/09/2003 | Takashi Motoyoshi | 52433/740 | 4063 |
| 26646 | 7590 | 06/27/2007 | EXAMINER | |
| KENYON & KENYON LLP ONE BROADWAY NEW YORK, NY 10004 | | | IP, SIKYIN | |
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Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

| | | |
|------------------------------|-----------------------|------------------|
| Office Action Summary | Application No. | Applicant(s) |
| | 10/658,062 | MOTOYOSHI ET AL. |
| | Examiner Sikyin Ip | Art Unit 1742 |

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).

Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1) Responsive to communication(s) filed on 11/20/06; 3/27/07.

2a) This action is FINAL. 2b) This action is non-final.

3) Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4) Claim(s) 1-4, 6, 8-10 and 15-22 is/are pending in the application.

4a) Of the above claim(s) 17-22 is/are withdrawn from consideration.

5) Claim(s) _____ is/are allowed.

6) Claim(s) 1-4, 6, 8-10, 15 and 16 is/are rejected.

7) Claim(s) _____ is/are objected to.

8) Claim(s) 17-22 are subject to restriction and/or election requirement.

Application Papers

9) The specification is objected to by the Examiner.

10) The drawing(s) filed on _____ is/are: a) accepted or b) objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11) The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12) Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a) All b) Some * c) None of:

1. Certified copies of the priority documents have been received.

2. Certified copies of the priority documents have been received in Application No. _____.

3. Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) Notice of References Cited (PTO-892)

2) Notice of Draftsperson's Patent Drawing Review (PTO-948)

3) Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date _____

4) Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____

5) Notice of Informal Patent Application (PTO-152)

6) Other: _____

DETAILED ACTION

Election/Restrictions

Restriction to one of the following inventions is required under 35 U.S.C. 121:

I. Claims 1-4, 6, 8-10, 15, and 16, drawn to a highly impact-resistant steel pipe, classified in class 148, subclass 320+.

II. Claims 17-22 are, drawn to a method for producing a highly impact resistant water quenched steel pipe, classified in class 148, subclass 570+. Although original/deleted claims 11-13 are method claims, they did not have extensive steps. Thus, they were examined with product claims. The inventions are distinct, each from the other because of the following reasons:

Inventions II and I are related as process of making and product made. The inventions are distinct if either or both of the following can be shown: (1) that the process as claimed can be used to make another and materially different product or (2) that the product as claimed can be made by another and materially different process (MPEP § 806.05(f)). In the instant case product as claimed can be made by another and materially different process such as furnace heating and oil quenching. Because these inventions are independent or distinct for the reasons given above and there would be a serious burden on the examiner if restriction is not required because the inventions have acquired a separate status in the art in view of their different classification, restriction for examination purposes as indicated is proper.

Because these inventions are independent or distinct for the reasons given above and there would be a serious burden on the examiner if restriction is not required

because the inventions require a different field of search (see MPEP § 808.02),
restriction for examination purposes as indicated is proper.

Since the original method claims 11-14 were more like product claims; thus,
product claims are considered as original presented claims and are selected for
continue examination.

Claim Rejections - 35 USC § 112

The following is a quotation of the first paragraph of 35 U.S.C. 112:

The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the same and shall set forth the best mode contemplated by the inventor of carrying out his invention.

Claims 1-4, 6, 8-10, 15, and 16 are rejected under 35 U.S.C. 112, first paragraph, as failing to comply with the written description requirement. The claim(s) contains subject matter which was not described in the specification in such a way as to reasonably convey to one skilled in the relevant art that the inventor(s), at the time the application was filed, had possession of the claimed invention.

The expressions "not more than 0.5% Cr" and "not more than 0.5% Mo" in claims 1-4 are not supported by the specification as originally filed. Specification as originally filed supports Cr and Mo as optional elements. However, when Cr and/or Mo are added to the claimed steel, Cr needs to be 0.005 to 0.5 wt.% and Mo needs to be 0.1 to 0.5 wt.% (page 4, lines 19-22). The expression "no more than 0.5% Cr" has introduced range of greater than zero to less than 0.005 wt.% as a new matter. The same reason

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applies to claim 16. The expression "no more than 0.5% Mo" has introduced range of greater than zero to less than 0.1 wt.% as a new matter.

A response filed by applicants dated March 28, 2006 has not provided support for the new ranges.

Claim Rejections - 35 USC § 103

The factual inquiries set forth in Graham v. John Deere Co., 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
2. Ascertaining the differences between the prior art and the claims at issue.
3. Resolving the level of ordinary skill in the pertinent art.
4. Considering objective evidence present in the application indicating obviousness or nonobviousness.

This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(f) or (g) prior art under 35 U.S.C. 103(a).

Claims 1, 6, and 8-10 are rejected under 35 U.S.C. 103(a) as being unpatentable over Japanese patent 6-179945.

The English abstract of JP'945 discloses a electric welded steel pipe for reinforcing motor car doors having an alloy with constituents whose wt% ranges overlap those recited by claims. Moreover, prior art tensile strength (TS)of 150 to 180Kgf/m² (equivalent 1471 to 1765.26MPA) and yield ratio(YR) of 70 to 85% overlaps with the TS range of 1700 MPA or more, and YR of 72% or less, respectively recited by claim 1. In

any event, the overlap in alloy and property ranges establishes a prima facie case of obviousness because it would be obvious to one of ordinary skill in the art to select the claimed ranges from the broader disclosure of the prior art since the prior art has the same utility and similar properties, see MPEP 2144.05.

In regard to composition, alloy 2 in table 1 on page 5 of JP'945 meets the composition recited by claims 7 and 8 and when calculated.

Even though dislocation density recited by claim 6 is not taught by prior art, such property would be expected since prior art teaches hot and cold working and quenching which creates dislocations, and also similar properties are obtained, and in absence of proof to the contrary.

The English abstract of JP'945 teaches a steel pipe having a microstructure containing martensite produced by normalizing comprising the steps of heating at austenitic temperature and cooling.

In regard to claim 10, prior art in the English translation, paragraph 8 teaches pipe can be square shape or a variant steel pipe.

JP '945 has Mn content 0.4 wt.% higher than the claimed 1.60 wt.% Mn. However, it is well settled that a prima facie case of obviousness would exist where the claimed ranges and prior art do not overlap but are close enough that one ordinary skilled in the art would have expected them to have the same properties, In re Titanium Metals Corporation of America v. Banner, 227 USPQ 773 (Fed. Cir. 1985), In re Woodruff, 16 USPQ 2d 1934, In re Hoch, 428 F.2d 1341, 166 USPQ 406 (CCPA 1970), and In re Payne 606 F.2d 303, 203 USPQ 245 (CCPA 1979). To overcome the prima

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facie case, an applicant must show that there are substantial, actual differences between the properties of the claimed compound and the prior art compound. In re Hoch, 428 F.2d 1343-44, 166 USPQ 406 at 409.

Claims 1-4, 6, 8-10, 15, and 16 are rejected under 35 U.S.C. 103(a) as being unpatentable over Okada et al (US Patent 5,374,322).

Okada discloses martensitic steel composition (abstract), tensile strength at least 120 kgf/mm² and yield ratio less than 75% (col. 2, lines 3-5), and cooling rate (col. 9, lines 3-56). Cooling rate is determined as function of microstructure (col. 9, lines 8-15) and thickness of steel plate (col. 9, lines 16-22). Cooling medium includes air, mist, shower, forced air, water quenching, or combination (col. 9, lines 45-56).

Okada discloses high tensile strength (TS) and low yield ratio (YR) martensitic steel welded pipes which meet the property limitations recited by claims 1 and 2. See examples in Tables 1 and 2: B1 having a TS 176Kg/mm² (1726MPA) and YR of 0.64 ; B6 having TS 183kg/mm²(1794.7MPA) and YR of 0.62; and B8 having TS of 185 (1814.3MPA) and YR of 0.62.

Okada discloses specific example B8 in Tables 1 and 2 having a Si content of 0.26% which falls within the equation range calculated at 0.17 to 0.31%, and has a tensile strength of 185kg/mm² (1814.3MPA) .

Even though dislocation density recited by claim 6 is not taught by prior art, such property would be expected since prior art teach hot and cold working which creates dislocations, and similar properties are obtained, and in absence of proof to the contrary.

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In regard to claim 9, Okada on lines 31 to 42 of column 10 discloses induction heating at austenitic temperature followed by cooling. Even though prior art does not teach a prior austenite grain size number of 6 or more as claim 14, such would be expected since composition, process, and process limitations are closely met, and in absence of proof to the contrary.

Okada discloses electric resistance welded pipe which would include round or square sectional shape recited by claim 10.

Okada discloses electric-resistant welded pipes B10 in Tables 1 and 2 having composition and properties that closely meet claims 3 and 4. Note B10 has a TS of 210kg/mm² (2059.47MPA) and is within the TS of 1,900MPA recited by claim 3 and 2,000MPA recited by claim 4. Although B10 has a yield ratio of 85% which is higher than the 68% or less recited by claim 3 and 66% or less recited by claim 4, such would not be a patentable difference.

Okada in claim 1 of column 19 discloses a welded pipe having an alloy with constituents whose wt% ranges overlap those recited by the claim 8. The overlap in alloy wt% ranges establishes a *prima facie* case of obviousness because it would be obvious to one of ordinary skill in the art to select the claimed ranges from the broader disclosure of the prior art since the prior art has similar utility and properties, see MPEP 2144.05.

Also similar to recited water quenching, Okada in Table 2 and lines 31 to 44 makes steel pipe by hot rolling, forming pipe with ERW process, induction heating and cooling. Even though prior art cools with air whereas the present invention cools with water at a

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higher rate, such would not be a patentable difference since water has not been excluded as a cooling medium (col. 9, lines 45-56). Also applicant has not demonstrated (e.g. by comparative test data) that cooling rate is somehow critical and productive of new and unexpected results.

Okada has Cr content 0.5 wt.% higher than the claimed 0.50 wt.% Cr. However, it is well settled that a *prima facie* case of obviousness would exist where the claimed ranges and prior art do not overlap but are close enough that one ordinary skilled in the art would have expected them to have the same properties, *In re Titanium Metals Corporation of America v. Banner*, 227 USPQ 773 (Fed. Cir. 1985), *In re Woodruff*, 16 USPQ 2d 1934, *In re Hoch*, 428 F.2d 1341, 166 USPQ 406 (CCPA 1970), and *In re Payne* 606 F.2d 303, 203 USPQ 245 (CCPA 1979). To overcome the *prima facie* case, an applicant must show that there are substantial, actual differences between the properties of the claimed compound and the prior art compound. *In re Hoch*, 428 F.2d 1343-44, 166 USPQ 406 at 409.

Response to Arguments

Applicant's arguments filed November 20, 2006 have been fully considered but they are not persuasive.

a beneficial result from optional appropriate Cr or optional appropriate Mo does not exclude

Applicants argue that "the applicants from claiming 0 to 0.5% Cr and 0 to 0.5% Mo. The applicants are disclosing."

But, "appropriate already defined by applicants in original specification

when they are excessively added. Therefore, their appropriate amounts are 0.005 to 0.050% Nb, 0.005 to 0.07% V, 0.005 to 0.5% Cu, 0.005 to 0.5% Cr, 0.1 to 0.5% Mo and 0.1 to 0.5% Ni. (Emphasis added).

Applicants argue that

The specification has clearly disclosed that greater than 0% to less than 0.005% Cr and greater than 0% to less than 0.1% Mo are **inappropriate** because they are “essentially the same as 0%.” But, applicants fail to point out page and line in the original specification to support their position.

Applicants’ argument in pages 17-18 is immaterial when applicants have no literal support for the recited limitations.

6. The cited prior art, JP 6-179945 (“JP ‘945”) and U.S. Patent No. 5,374,322

Applicants argue that “(“US ‘322) does not disclose or suggest the steel pipe composition of claims 1 to 4 ~~and 12~~.”

Instant claim 1 is listed as example against cited references.

| Wt.% | Claim 1 | JP 06179945 (abstract) | USP 5374322 (abstract) |
|------------|------------|---------------------------|--------------------------------|
| C | 0.19-0.35 | 0.15-0.3 | 0.15-0.4 |
| Si | 0.1-0.27 | 0.05-0.5 | 0.1-0.7 |
| Mn | 0.5-1.6 | 2-3 | 1-2.7 |
| P | <0.025 | 0.005-0.02 | <0.025 |
| S | <0.01 | 0.0005-0.006 | <0.015 |
| Al | 0.01-0.05 | 0.01-0.08 | 0.01-0.05 |
| B | 3-35 ppm | 0.001-0.003 | 0-0.005 |
| Ti | 0.005-0.05 | 0.01-0.2 | 0-0.1 |
| Cr | <0.5 | 0.1-0.7 | 1-3.5 |
| Mo | <0.5 | 0.1-1.5 | 0-1.0 |
| Fe | bal | Bal | Bal |
| TS | 1700MPa<= | 1471-1765 | 1176.8MPa<= (col. 2, lines 1-4 |
| YR=(YS/TS) | <72% | 70-85% | <75% (col. 2, line 3-5 |

7. The cited prior art, JP '945 and US '322, teaches air cooling, not water

Applicants argue that "quenching. Air cooling provides a cooling rate of at most a few 100°C/min. Water—"

With respect to instant recited water quenching, it is not excluded by US '322

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ing, water quenching is not excluded from the present invention as long as the bainite index or the cooling rate ⁵⁵ (R is within the range of the present invention.).

8. The cited prior art, JP '945 and US '322, does not disclose or suggest a

steel pipe which has, in combination, (i) a water quenched steel pipe having the steel composition defined in independent claims 1 to 4 and 17 and (ii) a tensile strength (TS) of

Applicants argue that " 1700 MPa (173.9 kgf/mm²) or higher."

Applicants' attention is directed to Table above that listed instant claim 1 and references.

Applicants' argument with respect to cooling rate of JP '945 is noted. But, according to applicants and instant Figure 2, cooling rate affects YR. Claimed YR in claim 1, for example, has been met by YR of JP '945.

Applicants' argument with respect to Mn is noted. But, there is no factual evidence that the claimed Mn content is critical.

Applicants' argument with respect to the tensile strength of JP '945 is noted. But, there is no evidence that the claimed tensile strength is controlled by Mn content.

Applicants' argument in page 26, first full paragraph of instant remarks is noted. But, examiner reiterates the response in two paragraphs above.

Applicants' argument in paragraph bridging pages 26-27 of instant remarks is noted. But, it is immaterial because the Cr and Mo contents are disclosed in the abstract of cited reference. They are overlapped the claimed range.

Applicants' argument in pages 27-28 of instant remarks is noted. But, it is well settled that the examples of the cited reference are given by way of illustration and not by way of limitation. In re Widmer, 353 F.2d 752, 757, 147 USPQ 518, 523 (CCPA 1965), In re Boe, 148 USPQ 507 (CCPA 1966), and In re Snow, 176 USPQ 328.

Applicants' argument of Mo content with respect to JP '945 is noted. But, JP '945 discloses Mo 0.1 to 1.5 wt.% (abstract) which overlaps the recited not more than 0.5 wt.%.

Applicants argue that cited references do not disclose the claimed compositions. But, applicants have not shown that the Mn and Cr contents are critical.

Applicants argue that US '322 teaches air cooling not water quenching. But water quenching is not exclude by US '322 (col. 9, lines 53-56).

Applicants argue that JP '945 and US '322 do not suggest combination of steel pipe and tensile strength. Applicants' attention is directed to abstract of JP '945 below

The pipe has a tensile strength of 150-180 kgf/mm², elongation of at least 10%, and yield ratio of 0.70-0.85. 1471 - 175.26 MPa

which teaches tensile strength and yield ratio anticipated the instant claim 1. US '322

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the resistance to impact of the steel member and to further increase its strength so as to decrease the weight of the member, it is necessary to achieve a T. S. of 120 kgf/mm² or more and a yield ratio (yield strength/tensile strength) of 75% or less. However, such levels discloses tensile strength at least 120 kgf/mm² and yield ratio 75% or less.

Applicants' argument with respect to US '322 in instant remarks is noted. But, claimed tensile strength and yield ratio have been taught

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the resistance to impact of the steel member and to further increase its strength so as to decrease the weight of the member, it is necessary to achieve a T. S. of 120 kgf/mm² or more and a yield ratio (yield strength/tensile strength) of 75% or less. However, such levels).

Applicants' argument in page 32, first full paragraph is noted. But, martensite of cited references, for example, US '322 is also formed by quenching

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degradation in toughness and easy occurrence of quenching cracks.

(Cooling Rate)

Restrictions on the cooling rate are introduced so as to make quenching achievable by air cooling without resulting in bends. The restrictions on the cooling rate are defined by the before-mentioned Equation (3).

According to the cooling conditions of the present invention, a martensite + bainite complex structure predominantly comprising martensite with a satisfactory level of strength and toughness and a yield ratio of 0.75 or less can be obtained. When the cooling rate is outside the range of the present invention, the desired effects mentioned above cannot be obtained.

15 . Moreover,

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ing, water quenching is not excluded from the present invention as long as the bainite index or the cooling rate ⁵⁵ R is within the range of the present invention.

The recited YR due to

the water quenching rate is also met by USP '322 "0.75 or less." See col. 9, lines 8-13.

Applicants' argument with respect to Cr content of USP '322 is noted. But, there is no factual evidence that the claimed Cr content is critical.

Applicants' argument with respect to dislocation density is noted. But, there is no factual evidence that the dislocation density would not have been inherently possessed by the steels of cited references.

Conclusion

The above rejection relies on the reference(s) for all the teachings expressed in the text(s) of the references and/or one of ordinary skill in the metallurgical art would have reasonably understood or implied from the text(s) of the reference(s). To emphasize certain aspect(s) of the prior art, only specific portion(s) of the text(s) have been pointed out. Each reference as a whole should be reviewed in responding to the rejection, since other sections of the same reference and/or various combination of the cited references may be relied on in future rejection(s) in view of amendment(s).

All recited limitations in the instant claims have been met by the rejections as set forth above.

Applicant is reminded that when amendment and/or revision is required, applicant should therefore specifically point out the support for any amendments made to the disclosure. See 37 C.F.R. § 1.121; 37 C.F.R. Part §41.37 (c)(1)(v); MPEP §714.02; and MPEP §2411.01(B).

Examiner Correspondence

Any inquiry concerning this communication or earlier communications from the examiner should be directed to S. Ip whose telephone number is (571) 272-1241. The examiner can normally be reached on Monday to Friday from 5:30 A.M. to 2:00 P.M.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Dr. Roy V. King, can be reached on (571)-272-1244.

The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

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ART UNIT 1742

S. Ip
June 24, 2007